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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,961	09/29/2003	Martin Dust	MOH-P010032	3944

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EXAMINER	
CHAPMAN JR, JOHN E	
ART UNIT	**PAPER NUMBER**
2856	

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/673,961	DUST, MARTIN	
	Examiner	Art Unit	
	John E. Chapman	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,7-11,13,16,17,19 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,7-11,13,16,17,19 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 14, 2004 has been entered.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 2 and 7-11, 16, 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harth, III et al. in view of Krautkramer et al.

Harth teaches measuring the thickness of a layer 18 in a vessel 14 using an ultrasonic transducer 40 in contact with an outside diameter surface of the vessel, and teaches that it is known in the art to measuring the thickness of the cladding layer of fuel rods (col. 4, lines 2-3). Accordingly, it would have been obvious in view of the disclosed background to use the apparatus of Harth to measure the thickness of the cladding layer of a fuel rod. The probe 40 appears to have a planar surface region (see page 20 of the Panametrics, Inc. transducer catalog), and if not, it would have been obvious in view of Krautkramer to use a probe having a planar surface region. Krautkramer teaches that it is well known in the art to use a flat probe on a cylindrical surface (see pages 290-293). Harth teaches operating at a frequency up to 100 MHz (see col. 4, lines 3-5), which frequency is required for cladding layers whose thickness lies

between .08 and 0.1 mm (see col. 3, line 66 to col. 4, line 6). Accordingly, it would have been obvious to measure thickness of tubes having a cladding layer down to .08 and 0.1 mm. In particular, it would have been obvious to measure thickness of tubes having a wall thickness less than 1 mm and a cladding layer between .08 and 0.1 mm.

Regarding claims 2, 11 and 17, Krautkramer teaches that the contact face has the shape of a narrow rectangle (see pages 290-291).

Regarding claims 7, 10 and 22, it would have been obvious to measure thickness of a cladding layer greater than .08 to 0.1 mm, such as 0.15 mm.

4. Claims 4, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harth, III in view of Krautkramer as applied to claims 1, 8 and 16 above, and further in view of Trulson et al.

The added difference between the claimed invention and the prior art consists in digitally processing the echo signal. Trulson teaches that it is well known in the art to digitally process an echo signal to reduce the chance of error and obtain more consistently accurate measurements (see col. 1, lines 53-57). Accordingly, it would have been obvious to digitally process the echo signals in Harth in order to reduce the chance of error and obtain more consistently accurate measurements.

5. Claims 1, 2 and 7-11, 16, 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano et al. in view of Krautkramer et al.

Nakano et al. teaches measuring the thickness of a cladding layer 2 in a clad tube 1 using an ultrasonic probe 3 in contact with an outside diameter surface of the tube. Nakano et al. does not indicate whether the clad tube is for nuclear fuel, but such limitation is not given any patentable weight since (1) it is recited in the preamble of the claim as an intended use for the cladding tube, (2) there is no step in the body of the claim specific to nuclear fuel, and (3) a steel tube (see col. 1, line 20) is inherently capable of containing nuclear fuel. The coupling surface of the probe 3 appears to be curved (see Fig. 8). Hence, the only difference between the claimed invention and the prior art consists in providing the probe 3 with a planar surface region. Krautkramer et al. teaches that it is well known in the art to use a flat probe on a cylindrical surface (see pages 290-293). Accordingly, merely to provide a planar surface on the probe 3 of Nakano et al. would have been obvious to one having ordinary skill in the art for the purpose of inspecting the cylindrical clad tube 1. Regarding the wall thickness of the tube, Nakano et al. teaches measuring the thickness of clad metal below 10 mm (see col. 9, lines 58-61). It is generally considered to be within the level of ordinary skill in the art to use a known method of testing on different sized articles. Accordingly, it would have been obvious to one of ordinary skill in the art to use the method of Nakano et al. measure the thickness of clad metal below 1 mm.

Regarding claims 7, 10 and 22, it would have been obvious to one of ordinary skill in the art to extend the utility of the method of Nakano et al. to measuring the thickness of a cladding layer of approximately 0.15 mm.

6. Claims 4, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano in view of Krautkramer as applied to claims 1, 8 and 16 above, and further in view of Trulson et al.

The added difference between the claimed invention and the prior art consists in digitally processing the echo signal. Trulson teaches that it is well known in the art to digitally process an echo signal to reduce the chance of error and obtain more consistently accurate measurements (see col. 1, lines 53-57). Accordingly, it would have been obvious to digitally process the echo signals in Nakano in order to reduce the chance of error and obtain more consistently accurate measurements.

7. Claims 1, 2 and 7-11, 16, 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pleinis et al. in view of Krautkramer et al.

Pleinis et al. teaches measuring the thickness of a tube liner in a zirconium tube for nuclear fuel using an ultrasonic transducer. Pleinis et al. does not indicate whether the transducer is in contact with the tube. Krautkramer et al. teaches that it is well known in the art to use a flat probe on a cylindrical surface (see pages 290-293) to ultrasonically inspect a cylindrical object. Accordingly, merely to use a flat probe on the surface on the zirconium tube of Pleinis et al. would have been obvious to one having ordinary skill in the art for the purpose of measuring the thickness of the tube liner. Regarding the wall thickness of the tube, it is generally considered to be within the level of ordinary skill in the art to use a known method of testing on different sized articles. Accordingly, it would have been obvious to one of ordinary

skill in the art to use the method of Nakano et al. measure the thickness of tubes having a wall thickness less no greater than 1 mm.

Regarding claims 7, 10 and 22, it would have been obvious to one of ordinary skill in the art to extend the utility of the method of Pleinis et al. to measuring the thickness of a tube liner of approximately 0.15 mm.

8. Claims 4, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pleinis in view of Krautkramer as applied to claims 1, 8 and 16 above, and further in view of Trulson et al.

The added difference between the claimed invention and the prior art consists in digitally processing the echo signal. Trulson teaches that it is well known in the art to digitally process an echo signal to reduce the chance of error and obtain more consistently accurate measurements (see col. 1, lines 53-57). Accordingly, it would have been obvious to digitally process the echo signals in Pleinis in order to reduce the chance of error and obtain more consistently accurate measurements.

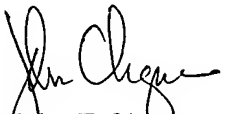
9. Applicant's arguments filed February 14, 2005 have been fully considered but they are not persuasive. Applicant argues that in cladding tubes for nuclear fuel with two or more layers formed of a zirconium alloy, the layers are metallurgically connected with each other. Such argument is more specific than the invention claimed, since none of the claims to recite cladding tubes comprising two or more layers formed of a zirconium alloy. Furthermore, while some processes may result in the zirconium layers being metallurgically connected with each other, it

is not clear that metallurgical bonding is inherent in all processes for forming cladding tube layers for nuclear fuel. Nor is it clear that the layers of a nuclear fuel cladding tube necessarily comprise two almost identical zirconium alloys. Accordingly, applicant's arguments are deemed to be more specific than the invention claimed.

Applicant argues that Krautkramer generally pertains to the ultrasound measuring in the case of curved surfaces and does not mention multi-layer cladding tubes for nuclear fuels. However, Krautkramer has been relied upon only for the general teaching of ultrasound measuring of curved surfaces and has not been relied upon for the teaching of ultrasound measuring of the thickness layers in cladding tubes. Rather, such teaching is provided by Nakano et al. To the extent that Krautkramer teaches that reduced sensitivity is to be accepted in using a flat probe on a curved surface, the fact that there may be a disadvantage to using a flat probe does not render such use unobvious. Rather, one must weigh the disadvantages with the advantages, for example, the versatility of being able to use a flat probe to measure cladding tubes having differing radii of curvature.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John E. Chapman whose telephone number is (571) 272-2191. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John E Chapman
Primary Examiner
Art Unit 2856